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EXAMINER

HUFFMAN, JULIAN D

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5-8, 41 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantell (U.S. 6,189,993 B1) in view of Billet (U.S. 6,010,205).

Mantell discloses:

With regards to claim 1,

an ink jet recording apparatus (fig. 4) comprising:

a recording head (fig. 4, element 20) provided with a pressure generating element (column 1, lines 24-26);

a scanning mechanism for moving the recording head in a main scanning direction (14);

a data developer for developing print data into multi-bit jetting data (132);

a drive signal generator for generating a drive signal including a plurality of drive pulses, on every unit print cycle (21);

a translator for translating the multi-bit jetting data into pulse select information associated with the respective drive pulses (21, column 10, lines 17-23);

a drive pulse supplier (20, 21) for selectively supplying at least one of the drive pulses to the pressure generating element in accordance with the pulse select information to drive the pressure generating element;

a basic recording mode for recording a dot having a size which is selected from one of a plurality of sizes, in a basic unit pixel which is associated with a unit recording area corresponding to the unit print cycle (draft mode, prints one dot per basic unit pixel area, column 5, lines 62-65);

a high-resolution recording mode for recording a dot in a fine unit pixel, a plurality of fine unit pixels being arranged within the unit recording area in the main scanning direction (any one of the higher levels of grayscale, up to four drops per pixel area, column 6, lines 21-39, pixels can be deposited at different fine unit pixel locations in a superpixel);

a scanning controller for causing the scanning mechanism to move the recording head in the main scanning direction (124); and

a mode selector for selecting one of plural recording modes including the basic recording mode and the high-resolution recording mode (fig. 5),

wherein the data developer develops the print data into the jetting data so as to indicate the size of the dot to be recorded in the basic unit pixel when the mode selector selects the basic recording mode (the number of dots deposited is equivalent to the size of the dot recorded); and

wherein the data developer develops the print data into the jetting data such that each bit therein indicates whether the recording is conducted or not in each associated

fine unit pixel, when the mode selector selects the high-resolution recording mode (the print data is digital and indicates whether recording is conducted or not in each pixel), wherein the same drive signal is used in each of the basic recording mode and the high-resolution recording mode (since the drops are identical throughout the recording modes, the same drive signal is used).

With regards to claim 2, the data developer develops the print data into the jetting data such that bits therein indicate the size of the dot to be recorded in the unit recording area, when the mode selector selects the basic recording mode (since the jetting data indicates how many droplets of ink to deposit in each unit recording area, it indicates the size of the dot to be recorded).

With regards to claim 5, the mode selector selects the recording mode in accordance with the print data (column 9, lines 58-62, the print mode is determined based on the media type and print quality, which are values stored with the print data and transmitted by the print driver).

With regards to claim 6, the plural drive pulses are of an identical profile (only one type of drive pulse is used).

With regards to claim 7, the drive pulses are spaced at constant intervals within the unit print cycle (fig. 3, the dots are constantly spaced, thus the drive signals are constantly spaced when the carriage moves at a constant velocity).

With regards to claim 8, an initial trigger for starting the unit print cycle is derived from the scanning mechanism (46).

With regards to claim 41, either one of the recording in the basic unit pixel and the fine unit pixel is performed by a single movement of the recording head in the main scanning direction (recording of the basic unit pixel in the draft recording mode is performed by a single movement of the recording head in the main scanning direction since only one droplet of ink is ejected in the unit pixel area).

With regards to claim 44, a volume of every ink droplet ejected from the recording head is the same irrespective of the mode selected by the mode selector (fig. 3).

Mantell adjust the recording speed depending on the maximum firing frequency (column 8, lines 29-41)

Mantell does not disclose the scanning mechanism moving the recording head at the same speed irrespective of the recording mode selected.

Billet discloses that by operating a device at the same speed regardless of a printing mode, nozzles are not operating at their maximum firing frequency for all of the print modes, and compensation for inoperative nozzles can be conducted by activating operative nozzles in their place (column 8, lines 56-63).

It would have been obvious to one having ordinary skill in the art at the time of the invention to move the carriage at a constant velocity regardless of the print mode, as suggested by Billet, for the purpose of enabling inoperative nozzles to be compensated by operative nozzles.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantell in view of Billet as applied to claims 1, 2, 5-8, 41 and 44 above and further in view of Bain (U.S. 4,521,786).

Mantell as modified discloses everything claimed with the exception of rewritable waveform select tables.

Bain discloses rewritable waveform select tables (column 4, lines 51-64).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate the waveform select tables of Bain into the invention of Mantell for the purpose of enabling jet-to-jet cross talk compensation or frequency-dependent compensation and closed loop printhead control (column 4, lines 51-64).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 51 is rejected under 35 U.S.C. 102(e) as being anticipated by Mantell.

With regards to claim 51, Mantell discloses a first recording mode with 3 drops per pixel is disclosed along with a second recording mode with 1 drop per pixel. In this instance the number of gradation levels that can be recorded in the first recording mode

is greater than the number of gradation levels that can be recorded in the second recording mode (figs. 3 and 4).

A discussion of the additional limitations of claim 51 is not provided herein since such discussion already appears above (see discussion of claim 1).

### ***Allowable Subject Matter***

Claims 38, 42, 45 and 50 are allowed.

### ***Response to Arguments***

Applicant's arguments filed 4 January 2008 have been fully considered but they are not persuasive.

Applicant argues that the Mantell and Billet references teach away from one another. Applicant argues that incorporating the teachings of Billet into Mantell eliminates the multiple print velocities that Mantell emphasizes as being important. However, the teachings of Mantell apply to the device when it is functioning properly. In the presence of a malfunctioning nozzle, the desired output of Mantell cannot be achieved. However, by incorporating the teachings of Billet into Mantell, printing can continue even with malfunctioning nozzles. Thus, even assuming arguendo that Billet and Mantell teach away from one another during proper operation of Mantell, incorporating Billet provides an improvement that enables Mantell to continue to produce quality printouts in the presence of malfunctioning nozzles.



In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's argument concerning claim 51 is not persuasive. Claim 51 does not require that the first recording mode is a basic recording mode and the second recording mode is a high-resolution recording mode. As such, Mantell discloses a mode with 3 dots per pixel that functions as a first recording mode with a higher gradation level than a second recording mode which records 2 dots per pixel or 1 dot per pixel.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julian D. Huffman/  
Primary Examiner, Art Unit 2853